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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,299	06/14/2003	Arpag Dadourian	5472P005	5872

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EXAMINER

SEVER, ANDREW T

ART UNIT PAPER NUMBER

2851

DATE MAILED: 03/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/601,299	<b>Applicant(s)</b> DADOURIAN, ARPAG	
	<b>Examiner</b> Andrew T Sever	<b>Art Unit</b> 2851	<i>Aw</i>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13 and 14 is/are allowed.
- 6) ☒ Claim(s) 1,2,5,7,8 and 12 is/are rejected.
- 7) ☒ Claim(s) 3,4,6 and 9-11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 June 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the projection screen containing retro reflective elements must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the retro reflective elements must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the presenter in front of the screen must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

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A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the placement of the projector, IR source and camera with respect to the person and screen must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the silkscreen-selected pattern with a white pigment onto the high gain retro reflective projection screen must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 2, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoneno (US 6,598,979) further in view of Harman (US 6,473,115.)

Yoneno teaches a method for generating a matte signal identifying the silhouette area of a presenter in front of a projection screen and upon that screen a projector displays images. Yoneno's method comprises of a) placing an infrared camera and an infrared illumination source in proximity to each other and to the projector; b) illuminating the projection screen and the presenter with infrared illumination from an infrared source; and c) observing the screen and the presenter with the infrared camera whose infrared signal levels constitute a linear matte signal defining the presenter's silhouette area. (see columns 9-11 starting at line 59 of column 9 and ending at line 34. the infrared camera is specified to be an infrared photo diode which outputs a linear signal (Spd see figure 4 for a sample of the signal) which comprise a linear matte signal defining the presenter's silhouette area.)

Yoneno does not specifically teach the use of a projection screen, which contains retro reflective elements.

Such elements are taught to be commonly used in projection screens by Harman, which teaches in column 3 lines 35-41 that retro reflective screen have the advantage of having gains of 10,000 to 16,000 and allow for low-cost low intensity projection systems to be used as compared to other screens. Accordingly given the advantages of retro reflective screens as taught by Harman it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a retro reflective screen for the screen in Yoneno.

*With regards to applicant's claim 2:*

As can clearly be seen in figure 6 of Yoneno the infrared source (IRD) is made coaxial with the infrared camera (IRPD)

*With regards to applicant's claim 7:*

Given that in general the projector is placed in a viewing direction of the screen and the retro reflective screens have gains of 10,000 to 16,000 as taught by Harman, it would also be obvious that in the position of the infrared illumination source those high gains would also be seen as they would be essentially uniform to a viewing audience.

*With regards to applicant's claim 8:*

Harman teaches that the retro reflective screen is made of miniature spherical or cubicle glass beads sandwiched between two layers of plastic polymer film. Since this screen is used to replace a standard screen, it would be obvious to make the miniature

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beads small enough that those in a front row audience could not see them (So that the projected image is not made to look granular). Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the retro reflective screen elements of such a size as to be substantially invisible to a front row audience.

8. Claim 5 rejected under 35 U.S.C. 103(a) as being unpatentable over Yoneno in view of Harman as applied to claims 1, 2, 7, and 8 above, and further in view of Leibe et al..

As described in more detail above Yoneno in view of Harman teaches a method for generating a matte signal identifying the silhouette area of a presenter in front of a projection screen containing retro reflective elements and then projecting an image with a projector. The method includes placing an infrared camera and an infrared illumination source in proximity to each other and to the projector, illuminating the projection screen and the presenter with infrared illumination, and observing the screen and the presenter with the infrared camera whose infrared signal levels constitute a linear matte signal defining the presenter's silhouette area.

Yoneno in view of Harman does not teach the infrared camera including a filter to block passage of visible light.

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A system for generating a matte signal identifying the silhouette of a person similar to that taught by Yoneno in view of Harman is taught by Leibe et al. in figure 1. A infrared camera is surrounded by infrared illuminators which image the screen (in Leibe it is a semi transparent table) to determine the location of a user or a user's appendage. Leibe teaches a cheap imaging system, which comprises of a black and white camera with a infrared filter mounted on it to block the passage of visible light. As taught in section 9, by using this system instead of the more expensive infrared specific components that have limited performance taught by Yoneno in view of Harman, Leibe is able to obtain a very effective system for a relative low cost. Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the infrared photo diode with a black and white camera with an infrared filter as taught by Leibe.

9. Claim 12 rejected under 35 U.S.C. 103(a) as being unpatentable over Genc et al. (US 2003/0227470.)

Genc teaches in paragraph 36 a dual gain screen comprising a majority of visible light reflective elements and a minority of retro infrared reflective elements, said retro reflective elements being sized small enough and spaced sufficiently apart from one another to be substantially invisible to persons viewing the projection screen at normal viewing distances. (The screen is a workspace, although not clearly stated the retro reflective markers are only visible in infrared light and visible to the tracker (infrared CCD) not to the user who sees only visible light.) Genc does not specifically state that



the retro reflective elements are sized small enough and spaced sufficiently apart from one another to be substantially invisible to persons viewing the projection screen at normal viewing distances, however since these are used only as coordinate points for the tracking system and the user is expected to interact with real and virtual objects, one with ordinary skill in the art at the time the invention was made would expect that they would be sized in such a way as not to further clutter the view, given Harman's teaching (as described above) that retro reflective material can be small; it would be obvious to one of ordinary skill in the art at the time the invention was made to make the retro reflective elements be sized small enough and spaced sufficiently apart from one another to be substantially invisible to persons viewing the projection screen at normal viewing distances.

*Allowable Subject Matter*

10. Claims 13 and 14 are allowed.

11. Claims 3, 4, 6, and 9-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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12. The following is a statement of reasons for the indication of allowable subject matter:

Claims 3, 4,6 and 9-11 were indicated allowable if re-written in independent form including the limitations of the base claims and any intervening claims for various reasons:

With regards to claim 3; although using a beam splitter is well known it would not be obvious to modify Yoneno in view of Harman to use one since Yoneno's positioning of the photodiode and infrared emitter accomplishes the same effect with fewer parts.

With regards to Claim 4; claim 4 teaches that the infrared source is made coaxial with the infrared camera lens axis by using a ring of infrared emitting diodes placed around a barrel of the infrared camera lens which is also taught in paragraph 36 of Genc et al., however there is no motivation except hindsight to combine Genc with Yoneno in view of Harman. The subject matter of claims 6 and 9-11 was not found in combination of the subject matter of claim 1 or similar subject matter.

Claims 13 and 14 were indicated as allowable since the combination of a visible light projector, and an infrared retro reflective element containing screen were not found in the prior art. Genc et al. does not teach a visible light projector; rather the visible images are produced by a head mounted display.

*Conclusion*

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6,454,415 to Vlahos is assigned to the applicant's assignee and contains similar subject matter.

US 2002/0093666 to Foote et al. teaches in figure 1, two IR source (5 and 10) and a IR camera 35 for tracking the location of a person in front of a visible projector (95)

US 6,554,434 to Sciammarella et al. teaches in figure 19 a projection system which includes a visible light projector and an IR camera which are projected towards a surface. A user interacts with the system by moving an Infrared emitting wand.

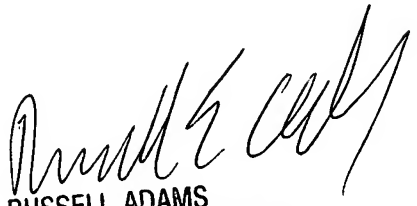
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T Sever whose telephone number is 571-272-2128. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russell Adams can be reached on 571-272-2112. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AS

  
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